CLAIMS:

1. A spatial information detecting device comprising:

at least two photoelectric converters configured to receive a light from a target space, into which a light intensity-modulated at a modulation signal having a predetermined frequency is being irradiated, and generate an electric output corresponding to an intensity of received light;

at least one electrode formed on each of said photoelectric converters;

a charge storage portion formed in each of said photoelectric converters by applying a control voltage to said at least one electrode to collect at least part of electric charges generated in said photoelectric converter;

a controller configured to control the control voltage applied to said at least one electrode such that an area of said charge storage portion in one of two different phase periods of said modulation signal is different from the area of said charge storage portion in the other phase period of said modulation signal;

a charge ejecting portion configured to output the electric charges collected in said charge storage portion; and

an evaluation unit configured to evaluate the target space according to a difference between the electric charges collected in the one of said two different phase periods by said charge storage portion formed in one of said at least two photoelectric converters, and the electric charges collected in the other phase period by said charge storage portion formed in the other one of said at least two photoelectric converters.

2. The spatial information detecting device as set forth in claim 1, wherein said at least two photoelectric converters receive light from the target space, into which a flashing light is being irradiated,

said controller controls the control voltage applied to said at least one electrode such that the area of said charge storage portion in a lighting period of said

flashing light is different form the area of said charge storage portion in a non-lighting period of said flashing light, and

said evaluation unit evaluates the target space by use of a difference between the electric charges collected in the lighting period of said flashing light by said charge storage portion formed in one of said photoelectric converters, and the electric charges collected in the non-lighting period of said flashing light by said charge stored portion formed in the other one of said photoelectric converters.

3. The spatial information detecting device as set forth in claim 1, wherein said at least one electrode is a plurality of electrodes, and said controller controls the number of said electrodes, to which the control voltage is applied, thereby changing the area of said charge storage portion.

4. The spatial information detecting device as set forth in claim 1, wherein said evaluation unit comprises an amplitude-image generator configured to generate an amplitude image having pixel values, each of which is provided by said difference.

5. The spatial information detecting device as set forth in claim 1, further comprising an amplitude-image generator configured to generate an amplitude image having pixel values, each of which is provided by said difference, and a gray-image generator configured to generate a gray image having pixel values, each of which is provided by one of amounts of electric charges collected in one of a lighting period and a non-lighting period of a flashing light by said charge storage portion, and an average of the amounts of electric charges collected in both of the lighting period and the non-lighting period by said charge storage portion.

6. The spatial information detecting device as set forth in claim 2, wherein said controller controls the control voltage applied to said at least one electrode such that the area of said charge storage portion formed in each of said photoelectric converters changes in synchronization with a flash timing of said flashing light.

7. The spatial information detecting device as set forth in claim 6, wherein said controller controls the control voltage applied to said at least one electrode of each of said photoelectric converters such that the area of said charge storage portion formed in one of said photoelectric converters is larger in the lighting period than the non-lighting period, and the area of said charge storage portion formed in the other one of said photoelectric converters is larger in the non-lighting period than the lighting period.

8. The spatial information detecting device as set forth in claim 7, wherein said controller controls the control voltage applied to said at least one electrode of each of said photoelectric converters such that the area of said charge storage portion formed in one of said photoelectric converters in the lighting period is equal to the area of said charge storage portion formed in the other one of said photoelectric converters in the non-lighting period.

9. The spatial information detecting device as set forth in claim 4, further comprising a characteristic-amount extracting portion configured to extract a characteristic amount of an object in said target space according to said amplitude image generated by said amplitude-image generator, a similarity calculating portion configured to calculate a degree of similarity between by

comparing said characteristic amount with a previously prepared template, and a target recognizing portion configured to recognize said object as a target object corresponding to said template when the degree of similarity is not smaller than a predetermined value.

10. The spatial information detecting device as set forth in claim 9, wherein said object to be detected is a face, and the spatial information detecting device further comprises a template storing portion configured to store a face template previously prepared according to characteristic amounts of said face, and said object recognizing portion recognizes said face as a person corresponding to said face template when the degree of similarity between said characteristic amount extracted by said characteristic-amount extracting portion and said face template stored in said template storing portion is not smaller than the predetermined value.

11. The spatial information detecting device as set forth in claim 4, further comprising a saturation determining portion configured to compare a predetermined threshold value with amounts of electric charges collected in at least one of said two different phase periods of said modulation signal by said charge storage portion, and an output regulating portion configured to regulate an electric output corresponding to the intensity of received light according to the comparison result.

12. The spatial information detecting device as set forth in claim 11, wherein said output regulating portion reduces the electric output of said photoelectric converter when the amounts of electric charges are greater than the threshold value.

13. The spatial information detecting device as set forth in claim 4, further comprising a saturation determining portion configured to compare a predetermined threshold value with amounts of electric charges collected in at least one of said two different phase periods of said modulation signal by said charge storage portion, and wherein said evaluation unit evaluates the target space by use of a preset difference value in place of said difference when the amounts of electric charges are greater than the threshold value.

14. The spatial information detecting device as set forth in claim 4, further comprising a saturation determining portion configured to compare a predetermined threshold value with amounts of electric charges collected in each of said two different phase periods of said modulation signal over a storing time period corresponding to a plurality of cycles of said modulation signal, and an output regulating portion configured to regulate an electric output corresponding to the intensity of received light by changing the storing time period according to the comparison result.

15. The spatial information detecting device as set forth in claim 4, further comprising a saturation determining portion configured to compare a predetermined threshold value with amounts of electric charges collected in each of said two different phase periods of said modulation signal over one cycle of said modulation signal, and an output regulating portion configured to regulate an electric output corresponding to the intensity of received light by changing a duration of at least one of said two different phase periods according to the comparison result.